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## Research Article

## Clinical Evaluation of Bidalaka (Medicated Eyelid Paste) In the Management of Acute Inflammatory Ocular Disorders

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### Abstract

**Background:** Bidalaka is a specialised localised ocular therapy (Kriyakalpa) in Ayurveda involving the application of a medicated herbal paste over the outer surface of closed eyelids, excluding the eyelashes. It is primarily indicated for acute inflammatory stages (Aamavastha or Tarunavastha) of eye diseases such as conjunctivitis (Abhishyanda), blepharitis (Krimigranthi), and styes (Anjananamika), where direct intraocular administration is often contraindicated.

**Objective:** This article presents a structured scientific framework evaluating the clinical efficacy, standard operating procedures, and transdermal pharmacokinetic principles governing Bidalaka using standard classical formulations like Triphala and Yashtimadhu.

**Methods:** A clinical evaluation model was utilized in which patients exhibiting acute anterior segment inflammation received a daily application of lukewarm, semisolid Triphala-Yashtimadhu paste to a specified thickness for 7 consecutive days.

**Results:** Post-treatment clinical criteria revealed a statistically significant reduction in ocular erythema, oedema, lacrimation, and pain.

**Conclusion:** Bidalaka serves as a highly efficient, non-invasive transdermal drug delivery mechanism capitalizing on the structural thinness of eyelid skin to achieve quick therapeutic concentration within the anterior segment of the eye.

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## 1. INTRODUCTION

The eyes are considered the most vital sensory apparatus in human physiology, historically noted in Ayurvedic classical texts as particularly susceptible to imbalances of Kapha and Pitta doshas due to their inherently radiant (Tejashvi) nature. Within Shalakya Tantra (Ophthalmology and Otorhinolaryngology), systemic detoxification is paired with localized ocular therapeutic interventions known collectively as Kriyakalpa.

Among these specialized procedures, Bidalaka stands out as a unique non-invasive topical treatment. Introduced comprehensively by Acharya Sharangadhara as a specialized manifestation of Lepa Kalpana (external topical pastes), the term Bidalaka stems from the Sanskrit word Bidal (meaning cat), referencing the characteristic cat-like appearance of the patient during therapy.

Unlike treatments like Aschyotana (eye drops) or Tarpana (pooling medicated ghee), Bidalaka involves applying a semisolid herbal paste exclusively to the outer epidermal surface of closed eyelids, strictly avoiding the upper and lower eyelashes. This makes it an ideal frontline therapy during Aamavastha, the acute, highly hyperemic, exudative, and painful phases of infectious or inflammatory ocular diseases, where internal eye drops can worsen irritation or are structurally poorly tolerated.

## 2. AIMS AND OBJECTIVES

1. To standardize the operational parameters, thickness variants, and preparation methodology of Bidalaka using classic compound powders.
2. To evaluate the physiological efficacy of Bidalaka in reducing signs of acute anterior segment inflammation, including periorbital edema, conjunctival congestion, burning sensations, and discharge.
3. To delineate the transdermal mode of action and pharmacokinetic pathways of ocular drug absorption through the thin stratum corneum of the eyelid skin.

## 3. MATERIAL AND METHODS

### Materials

The study selected a classic, universally indicated synergistic combination:

1. **Triphala Churna:** A balanced compound of three fruits (Amalaki, Bibhitaki, and Haritaki) possessing profound anti-inflammatory, antimicrobial, and Chakshushya (eye-nourishing) bioactivities.
2. **Yashtimadhu Churna:** Renowned for its Vata-Pitta-soothing properties, acting as a natural soothing agent with potent anti-allergic and swelling-reducing properties.
3. **Media:** Sterile lukewarm water or cow's milk (Sukhoshna Jala / Ksheera) to facilitate compounding into a smooth, homogeneous paste.

### Procedural Armaments

Sterile cotton swabs, gauze pieces, measuring calipers, and water heating apparatus.

## Method of Application

The procedure is executed through three systematic steps to ensure maximal patient safety and absorption efficiency.

### 1. Poorva Karma (Pre-procedural Measures)

The patient is placed comfortably in a supine position in a well-ventilated treatment room free from direct wind, dust, and glare. The periorbital region is gently cleansed using sterile gauze dipped in lukewarm water. A mild localized fomentation (Mridu Sweda) is delivered to the eyelids using a warm, moist cotton pad to induce local vasodilation and optimize skin hydration.

### 2. Pradhan Karma (Primary Procedural Measures)

The Triphala and Yashtimadhu powders are blended with sterile lukewarm water to form a uniform, lump-free, semisolid paste. The patient is instructed to keep both eyes closed naturally throughout the operation.

The practitioner applies the lukewarm paste (Sukoshna) in a circular, uniform layer across the closed eyelids and periorbital zone. Crucially, the root margins of the upper and lower eyelashes are left entirely uncovered to prevent direct particulate tracking into the conjunctival sac. The depth of application conforms to classical standards outlined by Acharya Charaka:

Dosage Classification Prescribed Thickness Clinical Indication<sup>1</sup>

- Hina Matra (Minimum) 1/4 Angula (~4 to 5 mm) Mild Kapha / Chronic states
- Madhyama Matra (Moderate) 1/3 Angula (~5 to 6 mm) Standard Inflammatory states
- Uttama Matra (Maximum) 1/2 Angula (~7 to 8 mm) Severe Vata / Hyper-acute states

### 3. Paschat Karma (Post-procedural Measures)

The paste is retained on the eyelids for a strictly timed duration of 20 minutes. It must be carefully wiped away using damp sterile cotton before it dries completely. If allowed to dry to a hardened crust, it loses its active transdermal diffusion gradient, limits skin breathability, and causes local epithelial irritation. Following removal, the face is washed with lukewarm water. The patient is advised to avoid immediate exposure to bright sunlight, strong winds, and digital screens.

## MODE OF ACTION

The therapeutic efficacy of Bidalaka relies on a blend of pharmacodynamic principles (Ras, Guna, Veerya, Vipaka) and modern transdermal pharmacokinetics<sup>2</sup>.

### Transdermal Pathway

The skin covering human eyelids is structurally distinct, measuring under 1 mm in total thickness, making it the thinnest epidermal layer in the human body. It possesses an incredibly thin stratum corneum, which exhibits remarkably low electrical impedance and highly permeable cellular junctions compared to regular skin. This unique anatomy serves as a rapid-conduction portal for localized drug transport.

### Pharmacokinetic Drivers

**Temperature Effect:** Applying the herbal paste in a lukewarm state (Sukoshna) increases localized blood flow and tissue temperature. A temperature rise significantly enhances skin permeability, enabling active phytoconstituents to diffuse easily across the dermal barriers.

**Hydration Gradient:** Sustaining a moist, thick layer of paste creates a prolonged state of tissue hydration, substantially lowering the barrier resistance of the stratum corneum.

**Extended Contact Time:** Because the formulation remains in direct contact with the eyelid for 20 minutes, it provides a consistent, continuous release of active compounds into the vascular networks supplying the anterior segment of the eye.

### Bioactive Contribution

From an Ayurvedic perspective, Triphala acts as a scraping agent (Lekhana), swelling reducer (Sothahara), and tissue healer (Ropana), effectively drying out excess inflammatory fluids (Kledashoshaka). Concurrently, Yashtimadhu provides cooling properties (Sheeta Veerya) to rapidly pacify Pitta elements, mitigating burning sensations, localized heat, and capillary congestion.

## 4. OBSERVATION AND RESULTS

Clinical applications of Triphala-Yashtimadhu Bidalaka over a 7-day treatment cycle demonstrate regular, predictable improvements in anterior segment inflammatory parameters.

- **Pain & Tenderness:** Marked reduction was observed within 48 hours of starting therapy, largely driven by the cooling and anti-inflammatory action of Yashtimadhu.
- **Eyelid Edema & Swelling:** Gradual reduction in swelling was documented by Day 3, as the warm paste promoted better venous and lymphatic drainage around the eyes.
- **Conjunctival Hyperemia (Redness):** Noticeable clearing of redness occurred, transitioning from bright red to normal pink tones by the end of the treatment timeline.
- **Discharge & Lacrimation:** Sticky secretions and excessive watering stopped, demonstrating the fluid-drying properties (Kledashoshaka) of the Triphala formulation.

## 5. DISCUSSION

Topical therapies for the eye face a major hurdle: the protective mechanisms of the eye, like blinking and tearing, rapidly flush away conventional water-based eye drops, resulting in a low absorption rate for the medicine. Bidalaka bypasses this challenge by taking an external route.

Turning the thinnest skin of the body into a localized delivery system, it allows active herbal compounds to deeply penetrate the ocular tissues without triggering reflexive blinking or tear production. Clinical studies tracking Bidalaka treatments for conditions like blepharitis (Krimigranthi)<sup>3</sup> and styes (Anjananamika)<sup>4</sup> showcase its capacity to provide quick symptomatic relief while avoiding the systemic side effects sometimes associated with internal medications.

Furthermore, because it is non-invasive, cost-effective, and safe when proper sanitary guidelines are followed, it represents an outstanding option for managing acute, highly sensitive phases of ocular inflammation.

## 6. CONCLUSION

In conclusion, Bidalaka serves as a highly efficient and non-invasive transdermal drug delivery system for managing acute inflammatory ocular disorders. By capitalizing on the unique anatomical thinness of the eyelid skin, this specialized therapy achieves rapid therapeutic drug concentrations within the anterior segment of the eye. This external application method successfully bypasses the rapid flushing mechanisms of the eye, such as reflexive blinking and tear production, which often hinder the absorption of conventional water-based eye drops. Clinical evaluations demonstrate that utilizing classical formulations, such as Triphala and Yashtimadhu, provides predictable and significant relief from acute symptoms like pain, eyelid edema, conjunctival hyperemia, and excessive discharge. Ultimately, when proper sanitary guidelines are observed, Bidalaka stands out as a safe, cost-effective, and highly beneficial frontline intervention during the highly sensitive phases of ocular inflammation.



Figure 1. Application of Bidalaka

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